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FIGURE 1 - SITE LOCATION MAP

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FIVE-YEAR REVIEW REPORT

ALBION-SHERIDAN TOWNSHIP LANDFILL SUPERFUND SITE

ALBION,
MICHIGAN

Pursuant to CERCLA

Prepared by:
United States Environmental Protection Agency
Region 5
Chicago, Illinois

Wm. E. Muno

William E. Muno, Director
Superfund Division, Region 5

9/6/02
Date

FIVE-YEAR REVIEW REPORT
EXECUTIVE SUMMARY
SEPTEMBER, 2002

ALBION-SHERIDAN TOWNSHIP LANDFILL SUPERFUND SITE

ALBION,
MICHIGAN

The completion of the current five-year review confirms that the Albion-Sheridan Township Landfill Superfund Site is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The remedy selected in the 1995 Albion-Sheridan Site ROD has been implemented under the 1999 Consent Decree, adjusted as appropriate, and remains protective. This is the first five-year review for the Albion-Sheridan Site.

The drum removal activities were completed in December of 1998. A Site perimeter fence was installed in 1999, along with construction of the new landfill cover and gas venting system. Erosion concerns regarding the landfill were evident soon after remedial action construction completion in 1999, requiring landfill repair work in 2000. Elevated gas probe readings along the east fence line in 2000 led to the addition of two more gas probe wells to be constructed in that area in 2001, and additional quarterly gas probe sampling. Gas probe readings have not been of concern since the last significant level was recorded in July 2000.

Groundwater monitoring has been performed since October 1999 at the Albion-Sheridan Site as approved in the 1999 Operation & Maintenance Plan. Two groundwater monitoring wells were added at the Site in 2001. Recent data shows that arsenic levels are declining at certain monitoring wells. The current trend suggests that the contingent groundwater remedy of in-situ oxidation will not be necessary at the Site. However, the published lowering of the U.S. EPA arsenic maximum contaminant level (MCL) for drinking water from 50 to 10 ppb will require groundwater arsenic data to be analyzed more closely in the future. The groundwater remedy is scheduled to be evaluated for effectiveness in 2004.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name ***(from WasteLAN)*****:** Albion-Sheridan Township Landfill

EPA ID ***(from WasteLAN)*****:** MID980504450

Region: 5	**State:** MI	**City/County:** Albion, Calhoun County

SITE STATUS

NPL status: X Final _ Deleted _ Other (specify) _____

Remediation status (choose all that apply): _ Under Construction X Operating _ Complete

Multiple OUs?* _ YES X NO	**Construction completion date:** 9/28/99

Has site been put into reuse? _ YES X NO

REVIEW STATUS

Lead agency: X EPA _ State _ Tribe _ Other Federal Agency _____

Author name: Jeff Gore

Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 5

Review period:** 5/2/02 to Sept., 2002

Date(s) of site inspection: June 19, 2002

Type of review:

X Post-SARA _ Pre-SARA _ NPL-Removal only
_ Non-NPL Remedial Action Site _ NPL State/Tribe-lead
_ Regional Discretion

Review number: X 1 (first) _ 2 (second) _ 3 (third) _ Other (specify) _____

Triggering action:

_ Actual RA Onsite Construction at OU #___ X Actual RA Start at OU# 1
_ Construction Completion _ Previous Five-Year Review Report
_ Other (specify) _____

Triggering action date ***(from WasteLAN)*****:** 9/4/1997

Due date ***(five years after triggering action date)*****:** 9/4/2002

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

U.S. Environmental Protection Agency
Region 5
Five Year Review
Albion-Sheridan Township Landfill Superfund Site
Albion, Michigan
September 2002

I. Introduction

The United States Environmental Protection Agency (U.S. EPA) Region 5 has conducted a five-year review of the remedial actions implemented at the Albion-Sheridan Township Landfill Superfund Site in Albion, Michigan. The review was conducted between May and September 2002. This report documents the results of the five-year review. The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of the review are documented in the five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and make recommendations to address them.

This review is required by statute. U.S. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA 121(c), as amended, states:

> If a remedial action is selected that results in any hazardous substances, pollutants, or contaminants remaining at the site, the remedial action shall be reviewed no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the first five-year review for the Albion-Sheridan Landfill Site. Due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, this statutory five-year review is required. The review date is triggered by the initiation of remedial response action which took place September 4, 1997.

II. Site Chronology

Table 1 lists the chronology of events for the Albion-Sheridan Landfill Superfund Site.

Table 1: Chronology of Site Events

Date	Event
1986	Initial discovery of problem
1988	Proposed for NPL listing
1989	NPL final listing
1990	Surface drum removal
1992	Remedial Investigation/FS initiated
1995	Remedial Investigation/FS complete
1995	ROD signed
1997	Remedial Action Start
1999	RD/RA consent decree
1999	Remedy construction completion
2000	Landfill erosion repair completed
2001	Additional gas probe & monitoring wells placed

III. Background

A. Physical Characteristics

The Albion-Sheridan Township Landfill Site is a closed landfill located at 29975 East Erie Road, approximately one mile east of Albion, Michigan, on the eastern edge of Calhoun County (See figure). The City of Albion has a population of approximately 10,000. The area incorporating the landfill occupies about 18 acres of land. A larger area to the east and north is enclosed by the Site security fence and is approximately 47 acres in size. There is an abandoned building on-site just inside the entrance gate, on the south end of the enclosed property.

B. Land and Resource Use

The Site is surrounded by a combination of residential, agricultural, commercial and industrial properties. Five residences are located approximately 1000 to 1500 feet southwest of the landfill

along East Erie Road. Several residences and commercial businesses are located along Michigan Avenue about 500 feet north of the Site fence. Housing developments are located to the east and northwest of the Albion Site, and undeveloped land formally used for agriculture is immediately west of the Site. An active railroad track borders East Erie Road to the south of the landfill, and beyond the railroad tracks lies a wooded area including the North Branch of the Kalamazoo River. South of the river is agricultural land. The Site does not fall within the flood plain of the river.

C. History of Contamination

The Albion-Sheridan Site had been used as a sand and gravel pit and also used for open, non-permitted dumping for an unspecified period of time prior to 1966. From 1966 to 1981, the landfill was privately owned and operated by Mr. Gordon Stevick. The landfill accepted municipal refuse and industrial wastes from households and industries in the City of Albion and nearby townships. In the early 1970s, the Michigan Department of Natural Resources (MDNR) approved the landfill to accept an estimated 6,000 cubic yards of metal plating sludges. Other materials such as paint wastes and thinners, oil and grease, casting sand, and dust, sand and dirt containing fly ash were also disposed of at the Albion-Sheridan Landfill. The sludges remained buried at the Site. The landfill ceased operation in 1981.

D. Initial Response

In 1986 a U.S. EPA Field Investigation Team (FIT) contractor performed a site screening inspection to score the Site for the Hazardous Ranking System (HRS). In 1988 U.S. EPA proposed that the Site be included on the National Priority List (NPL), and in 1989 Albion-Sheridan was officially placed on the NPL and designated a Superfund Site. During 1988 and 1989 a U.S. EPA technical team observed surface debris on the landfill, including drums which appeared to contain grease and paint waste. Some of the waste was classified as RCRA hazardous waste for toxicity and ignitability. Certain waste samples contained VOCs including ethylbenzene, toluene, tetrachloroethylene, 1,1,1-trichloroethane and xylene.

On March 19, 1990 U.S. EPA issued a unilateral administrative order (UAO) to five potentially responsible parties (PRPs) stating that a removal action was appropriate for the Site. The UAO was amended on May 3, 1990 to delete one of the PRPs. Two of the PRPs performed the removal action of an estimated 46 drums from the landfill surface later in 1990. 22 drums were overpacked and sent to an off-site facility for incineration. The remaining 24 drums were crushed and sent to a Type 2 Solid Waste Landfill in the State of Michigan.

E. Basis for Taking Action

Remedial planning began as the Albion-Sheridan Superfund Site was proposed for the National Priorities List on June 24, 1988. The Site became a final NPL listing on October 4, 1989.

A remedial investigation (RI) was carried out from January 1992 to April 1994. The major results of the RI, and the conditions at the Albion-Sheridan Site at that time found:

* The thickness of the existing landfill cover from one foot to approximately four feet. The minimum cover thickness for a closed landfill in the State of Michigan required at least two feet. Refuse material was found scattered at the ground surface throughout the area of the landfill. The cover had undergone significant revegetation since landfilling had stopped, consisting mainly of grass with some patches of small trees. The thickness of the fill material in the landfill ranged from 16 to 35 feet.

* The geology of the Site is characterized by approximately 20 to 54 feet of glacial sediments overlying sedimentary bedrock. There were no obvious clay confining layers beneath the Site, although discontinuous layers containing silt and/or clay did exist, creating an unconsolidated sediments aquifer. The uppermost bedrock beneath the Site was generally encountered at an approximate elevation of 935 to 925 mean sea level (MSL).

* Groundwater beneath the Site is contained within the unconsolidated sediments aquifer, which was encountered at depths of 10 to 30 feet below ground surface, and the bedrock aquifer. The direction of groundwater flow in the unconsolidated unit was west-southwest near the landfill and curved in a more southerly direction near the North Branch of the Kalamazoo River.

* Several VOCs, SVOCs and pesticides/PCBs were present in landfill waste samples, although many of them were found in estimated concentrations, below the detection limit. 4-methyl phenol was the most concentrated contaminant at 15 mg/kg. A number of inorganic substances were present above background soil levels including antimony, arsenic, chromium, copper, lead, mercury and zinc. The highest levels included lead at 208 mg/kg, arsenic at 13 mg/kg and chromium at 13 mg/kg.

* Test pitting revealed one area of the landfill which contained an estimated 200-400 drums. Sampling results showed some of the drums contained liquids, solids and suspected paint sludges; contaminant concentrations included levels up to 730,000 1,2,4-trimethyl benzene, 6500 ppm acetone, 2400 ppm aluminum and 3 ppm arsenic.

* Groundwater samples taken at 13 monitoring wells surrounding the landfill revealed only one organic compound above the MCL, 1,2-dibromo-3-chloropropane. No SVOCs were detected above background concentrations. Arsenic, ammonia-nitrogen, cobalt, iron, manganese and nitrate/nitrite were detected above background, and antimony and nitrate exceeded established MCLs at two well locations.

U.S. EPA and the Michigan Department of Natural Resources (MDNR) prepared a Record of Decision (ROD) in March of 1995 which outlined the elements of a comprehensive remedy at the Albion-Sheridan Landfill Site. Later on in July of 1999 a corresponding Consent Decree was entered U.S. District Court, which was signed by U.S. EPA, the City of Albion, MI and other

PRPs.

IV. Remedial Actions

A. Remedy Selection

The major components of the Albion-Sheridan Landfill Site remedy involved implementation of the following:

- Removal, off-site treatment and disposal of the located landfill drums which contain hazardous and liquid wastes, as well as other drums encountered during grading of the landfill surface.

- Construction of a solid waste landfill cover which makes use of a Flexible Membrane Liner (FML) over the entire landfill mass.

- Design studies to determine if a passive venting or active landfill gas collection system should be installed at the Albion-Sheridan Site.

- Monitoring of groundwater to ensure effectiveness of the remedial action in lowering the arsenic concentration in groundwater through natural oxidation.

- Institutional controls on landfill property to limit both land and groundwater use, and controls on adjacent property to limit only groundwater use until the clean-up standard is attained.

A contingent remedy for groundwater treatment was also included for the Albion-Sheridan Site: Treatment of groundwater by in-situ oxidation if, five years after landfill cap installation, the arsenic concentrations in the groundwater are not declining at a sufficient rate and contamination threatens residential wells. A future consideration at the Site is the published revision of the U.S. EPA arsenic maximum contaminant level (MCL) for drinking water, lowering the required level from 50 ppb to 10 ppb by 2006.

B. Remedy Implementation

U.S. EPA issued special notice letters on June 6, 1995 to the private party group members (PRPs) associated with the Albion-Sheridan Landfill Superfund Site. Four PRPs were offered the opportunity to undertake the remedial design and remedial action (RD/RA) during negotiations in the summer of 1995. Negotiations failed, however, and U.S. EPA issued a UAO to four PRPs requiring them to conduct the RD/RA. Two of the PRPs, Cooper Industries and Corning, Inc. complied with the UAO, and retained a contracting consultant firm in March or 1996 to assist them with Site activities.

The PRP contractor received approval from U.S. EPA for a Remedial Design Work Plan in August of 1996. The Remedial Design for the Site was completed in August of 1997, and a Remedial Action Work Plan was approved in September of 1997. From December of 1997 through September of 1998, the PRP contractor performed implementation of the remedial action at the Site, excavating and disposing of located drums, installing and abandoning monitoring wells, and removing an on-site underground storage tank.

Drum removal activities were completed in December of 1998. A permanent Site perimeter fence was installed in 1999, along with construction of the new landfill cover. Components of the multi-layer landfill included:

- Fill Layer: The fill layer consisted of six inches of graded cover fill placed over the landfill waste.

- Gas Collection Layer: This layer consists of a 12-inch thick sand layer on top of the existing waste mass and fill layer.

- Flexible Membrane Liner (FML): The FML consists of a layer of linear low density polyethylene (LLDPE). Textured FML was placed along the south end of the landfill with the steepest slope, and smooth FML was placed over the remaining portion of the landfill. The FML panels were joined by a fusion weld.

- Drainage Layer: A geocomposite drainage net, which consists of a layer of geonet between layers of geotextile, was installed on top of the FML.

- Cover Soil Layer: An 18-inch thick cover soil layer was installed over the entire landfill cap. There was no compaction requirement for the cover soil layer.

- Topsoil Layer: A minimum of six inches of top soil was installed over the cover soil layer and fertilized.

- Vegetative Cover: Native plant species seeding was used to establish a vegetative cover to control erosion.

A Remedial Action/ Remedial Design Consent Decree was finalized and entered in U.S. District Court in July of 1999. The RD/RA CD brought in the PRPs Decker Corp. and the City of Albion, Michigan to join with Cooper and Corning. The CD required Decker and the City of Albion to implement all operation & maintenance activities at the Albion-Sheridan Site, while Cooper and Corning were responsible for the remedial design and remedial action construction.

Remedial Action construction activities officially concluded in September of 1999 with the completion and signing of the Preliminary Completion Report for the Albion-Sheridan Site.

C. Systems Operations/ Operations and Maintenance

Erosion concerns regarding the landfill were evident soon after remedial action construction activities were completed in September of 1999. During Site inspections in January, February and April 2000, U.S. EPA and MDEQ documented significant landfill slope and drainage basin erosion at a number of locations. Vegetation had not been established at numerous areas and the landfill membrane liner (FML) was exposed at certain spots on the slope. A conference call was held and a comment letter was sent from U.S. EPA to the PRP contractor in April 2000 outlining the deficiencies in the landfill cover.

U.S. EPA issued a letter in June 2000 stating that the Albion-Sheridan PRP group was out of compliance with the terms of the RD/RA Consent Decree, after they failed to adequately respond to the April 2000 comment letter. In July 2000, the Albion-Sheridan PRP group issued a response letter to U.S. EPA, agreeing to provide a work plan to address the Site erosion concerns. The work plan was approved in September 2000, with the landfill erosion repair work taking place in September and October of that year. A final inspection of the landfill repair work took place during May 2001.

Monitoring of the Albion-Sheridan groundwater and gas probes as approved in the Site Operation & Maintenance Plan began in October 1999. Two additional fence line gas probes and two additional groundwater monitoring wells were constructed in June 2001, after monitoring showed some concerns. The gas probes were added because elevated gas levels were recorded along the eastern fence line on two consecutive quarterly sampling events. The groundwater wells were added over concern of proper coverage of groundwater flow on the eastern side of the landfill.

V. Progress Since Last Five-Year Review

This is the first five-year review for the Albion-Sheridan Landfill Site.

VI. Five Year Review Process

The Albion-Sheridan Landfill Site five year review was prepared by Jeff Gore, U.S. EPA Remedial Project Manager for the Site. Mary Schafer, State Project Manager with the Michigan Department of Environmental Quality (MDEQ), also assisted with the review. The five year review consisted of a Site inspection and review of relevant documents. The completed report will be available in the Site information repository and the U.S. EPA website for public view.

Community relations ongoing at the Albion-Sheridan Landfill Site include responding to local resident concerns over progress of the operation and maintenance of the remedy. Residents living near the landfill have been in contact with U.S. EPA and MDEQ requesting information regarding Site remedial and sampling activities. An advertisement notice announcing the five year review process was placed for public viewing.

VII. Five Year Review Findings

A. Site Visit

The Albion-Sheridan landfill Site has been visited a number of times by the current remedial project manager over the past three years. The most recent visit was performed on June 19, 2002, in order to inspect the Site for this five year review. Jeff Gore of U.S. EPA and Mary Schafer of MDEQ were present during the June inspection.

The Site perimeter security fence was secured with the access gate locked. Two fence posts near the access gate were bent, and the barb wire along the fence top was pulled off of eight lengths of fence posts on the east side of the Site. An on-site building near the entrance had numerous broken windows, and debris was piled up in and near the structure.

The landfill cap was in good condition with covered vegetation, and showed no excessive wear, extensive erosion gullies or surface breaks. The 2000 landfill construction repair activities seemed to be effective in maintaining cap integrity, surface drainage and runoff. Minor issues noticed at the landfill included some animal burrowing near the south toe and southwest corner of the cap, a few sparse vegetation spots around the perimeter cap slope, and some erosion along the south and west slopes of the landfill cap road. A small amount of sediment had also begun to build up in the east drainage basin.

The groundwater monitoring wells were found to be painted, capped and locked. The monitoring wells, bollards and above ground piping were in good condition. Issues noticed involved several monitoring wells and piezometers whose markings could not be read, and some well locks which had become somewhat rusted.

B. Risk Information Review

The following standards were identified as applicable or relevant and appropriate requirements (ARARs) in the ROD for the Site and were reviewed for changes that could affect protectiveness:

- Safe Drinking Water Act Maximum Contaminant Levels (MCLs);

-Resource Conservation and Recovery Act (RCRA) hazardous and solid waste disposing and storage regulations;

- Michigan Environmental Response Act for soil and groundwater;

- Michigan Solid Waste Management and Air Pollution Acts;

C. Data Review

Groundwater monitoring has been performed since October 1999 at the Albion-Sheridan Landfill Site as approved in the February 1999 Operation & Maintenance Plan, in order to determine the trend of groundwater contaminants at the Site. The most recent groundwater sampling event in October 2001 taken from 17 monitoring and three residential wells showed the following results:

- The only regulatory standards to be exceeded were Michigan residential drinking water criteria for dissolved manganese (50 ppb), aluminum (50 ppb) and ammonia (10 ppm). There are no U.S. EPA primary MCLs for these three compounds. There was a slightly elevated manganese level of 59 ppb at residential well RW–04, and elevated levels ranging from 82 ppb to 1.22 ppm at 10 of the 17 monitoring wells. The residential well will be monitored closely in the future, to observe the manganese levels in the groundwater. An aluminum level of 110 ppb was detected at one monitoring well, and elevated ammonia levels ranging from 10.4 ppm to 21.2 ppm were detected in three monitoring wells.

- Arsenic levels are declining, especially at monitoring well MW-06SB. The October 2001 reading of 25 ppb is significantly lower than the previous levels detected at a range of 90 ppb to 164 ppb. The published lowering of the U.S. EPA arsenic maximum contaminant level (MCL) for drinking water from 50 to 10 ppb by 2006 will require groundwater arsenic data to be evaluated more closely in the future.

- Benzene, vinyl chloride and 1,2-dibromo-3-chloropropane were not detected in any of the 20 groundwater samples taken during the October 2001 event.

Monitoring of the Albion-Sheridan Site landfill gas as approved in the 1999 Operation & Maintenance Plan, consisted of sampling five gas probes a minimum of eight consecutive quarters beginning in October of that year. However, due to elevated readings in January, April and July 2000 at gas probe GP-2 along the east fence line, the sampling was extended to a minimum of 12 consecutive quarters. In addition, two more gas probes were installed along the Site east fence line in June 2001 bringing the total to seven, and a gas monitoring contingency plan was put in place in case the elevated gas readings continued. A summary of the gas probe monitoring data indicated the following:

- After an initial reading of 0% gas in October 1999, gas probe GP-2 along the east fence line had readings of 18% gas in January 2000, 4% gas in April and 3% gas in July.

- Gas probe GP-2 has since had readings of 0% gas except for 0.1% gas in January 2001.

- The only other perimeter gas probe to show a gas reading was gas probe GP-3 at 0.4% gas in January 2000.

- There have been no detections of hydrogen sulfide (H2S) in any of the gas probes during the operation & maintenance sampling program.

VIII. Assessment

The following questions address the protection of human health and the environment of the remedy at the Albion-Sheridan Landfill Superfund Site.

Question A: Is the remedy functioning as intended by the decision documents?

- **Implementation of Institutional Controls and Other Measures:** The 1995 ROD required institutional controls implementing deed and access restrictions to prevent development of the Site, and to assure the integrity of the remedial action. Site access and use is restricted with a security perimeter fence, as is the use of any contaminated groundwater associated with the Site. These controls and restrictions remain in place with the City of Albion to prevent property access and contaminated groundwater use is relation to the remedial action.

- **Remedial Action Performance:** The major component of the Albion-Sheridan remedial action completed in September 1999 was the construction of a multi-layer landfill cap, including the use of a Flexible Membrane Liner (FML). Erosion concerns related to the landfill were evident soon after remedial action construction activities were completed. U.S. EPA and MDEQ documented significant landfill slope and drainage basin erosion at a number of locations during Site inspections in January, February and April 2000. Vegetation had not been established at numerous areas and the landfill membrane liner (FML) was exposed at certain spots on the slope. As a result, landfill erosion repair work was required, with construction activities occurring in September and October of 2000. A final inspection of the landfill repair work during May 2001 and the five-year review inspection in June 2002 confirmed that the repair work had kept the integrity of the landfill in place. Future groundwater data evaluation at the Albion-Sheridan Site will be impacted by the U.S. EPA revision of the arsenic MCL, which requires a 10 ppb standard in 2006. Groundwater concentrations of manganese, ammonia and aluminum are currently above Michigan residential drinking water criteria at certain Site locations. There are no primary U.S. EPA MCLs for these three compounds.

- **System Operations/O&M:** System operations have included gas probe and groundwater monitoring, as well as landfill maintenance in order to keep the integrity of the cap intact. Elevated gas probe readings at GP-2 in 1990 required the addition of two gas monitoring probes along the east fence line, which were constructed in 1991. Two additional groundwater monitoring wells were also constructed during 1991. Recent monitoring well data showing declining levels of arsenic is positive, and if continued, would reduce the need for any contingent groundwater remedy.

- **Cost of System Operations/O&M:** Long-term operation and maintenance costs at the Albion-Sheridan Landfill Site have recently averaged approximately $75,000 per year. Items such as the 2000 landfill erosion repair work and the 2001 gas probe and monitoring well additions have raised operation and maintenance costs above those levels. Annual costs at the Site should decrease in the future, as savings are realized after the progression from quarterly to annual groundwater monitoring during the operation & maintenance program.

- **Opportunities for Optimization:** Minimizing any future landfill erosion, thus eliminating potential Site repair work, is the most likely opportunity for optimization at the Albion-Sheridan Landfill. Other opportunities relate to efficiently performing the required Site operation, maintenance and monitoring activities.

- **Early Indicators of Potential Remedy Issues:** There have been no signs of significant landfill cap erosion at the Site since repair work was completed in October 2000. Landfill gas emission concerns along the east fence line have diminished since July 2000, as gas probe readings at GP-2 have dropped to 0%, except for a reading of 0.1% gas in January 2001. U.S. EPA published a revised arsenic MCL standard for drinking water in January 2001, lowering the required level from 50 ppb to 10 ppb by 2006. The lower arsenic standard may be more difficult to achieve at all Albion-Sheridan Site groundwater monitoring locations.

Question B: Are the assumptions used at the time of remedy selection still valid?

- **Changes in Standards and To Be Considered:** U.S. EPA published a revised arsenic MCL standard of 10 ppb for drinking water in January 2001, requiring the 10 ppb level by 2006. No other significant changes to federal MCLs nor State groundwater standards for Albion-Sheridan Site related listed contaminants have changed since the ROD in 1995. RCRA regulations regarding waste storage and landfill operation & maintenance at the Site remain essentially unchanged. The State of Michigan has recently adapted a permanent marker requirement for all sites where waste is to remain in place, such as landfills or containment remedies. The marker must be made out of stone, cast metal or some other durable material, and describe the restricted area of the site and the nature of any restrictions. Signs affixed to a fence, post or building are generally not acceptable as permanent markers. Michigan also has a new wildlife regulation regarding fencing passage for small deer. Superfund sites are not required to comply, but the option is open to lower any stretch of fence to a 48" height to allow for a deer crossing.

- **Changes in Exposure Pathways:** No new exposure pathways have been discovered at the Albion-Sheridan Landfill Site. Two additional gas probe wells

and two more groundwater monitoring wells have been added to the Site monitoring program. Existing pathways of potential groundwater and surface water migration will need to be reevaluated in the future, since U.S. EPA published a revised arsenic MCL standard for drinking water, lowering the required level from 50 ppb to 10 ppb by 2006.

- **Changes in Toxicity and Other Contaminant Characteristics:** Toxicity and other factors for contaminants of concern have not changed.

- **Changes in Risk Assessment Methodologies:** Risk assessment methodologies used at the Albion-Sheridan Site since the ROD have not changed, and do not call into question the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

It is suspected that vandalism is to blame for broken windows and debris at an on-site abandoned building. There has been no other significant information of concern that could call into question the protectiveness regarding the remedy for the Albion-Sheridan Landfill Site.

IX. Issues

Issues that were discovered during the five-year review process and the Albion-Sheridan Landfill Site inspection are noted in Table 2.

Table 2: Identified Issues

Five-Year Review Issues	Currently Affects Protectiveness (Y/N)
Significant landfill erosion occurred after the 1999 construction completion, requiring repair work in 2000.	N
Elevated landfill gas probe emissions in 2000 required construction of two additional gas probes along the east fence line, and additional gas monitoring.	N
U.S. EPA published a revised arsenic MCL standard of 10 ppb for groundwater in January 2001, required 2006.	N
It is suspected that vandalism may occur periodically at the Site.	N

Issues Noted at Site Inspection	
Barb wire pulled off fence.	N
Minor landfill burrowing, a few sparse vegetation spots and slight cap road erosion.	N
Several monitoring wells/ piezometers did not have readable markings.	N
On-site building had numerous broken windows and piled up debris.	N

X. Recommendations and Follow-up Actions

The following recommendations and follow-up actions address the issues which were identified during the five-year review and Site inspection:

1) Future groundwater monitoring data should be analyzed to account for the U.S. EPA revised arsenic MCL standard of 10 ppb.

2) The minor landfill burrowing, sparse vegetation spots, slight cap road erosion and removed barb wire fencing should be repaired and periodically inspected.

3) The monitoring wells/ piezometers which did not have readable markings should be identified appropriately.

4) The on-site building with numerous broken windows and piled up debris should be demolished, or cleaned and boarded up.

The following issues noted during the five-year review and Site inspection period have been identified, and have been corrected or are in the process of being corrected.

5) Landfill erosion repair work completed in October 2000.

6) Two additional landfill gas probes on the east fence line and additional quarterly gas monitoring. Elevated landfill gas levels have not occurred since July 2000.

7) Periodic Site inspections to record and deter any future potential vandalism.

Table 3 : Recommendations and Follow-up Actions

New Five-Year Review Issues	Recommendations Follow-up Actions	Party Responsible	Oversight Agency	Mile-stone Date	Follow-up Action: Affects Protective ness (Y/N)
Revised 10 ppb arsenic MCL	Discussion of future groundwater monitoring data	Albion RP Group/ USEPA	EPA/MDEQ	Annual review	Y (2006)
Site erosion, road and fence repair	Corrections and periodic inspections	Albion RP Group	EPA/MDEQ	Annual review	N
Monitoring well markings	Corrections and periodic inspections	Albion RP Group	EPA/MDEQ	Annual review	N
On-site building problems	Demolition or corrections and inspections	Albion RP Group	EPA/MDEQ	2003/ annual review	N
Ongoing Site Issues					
2000 erosion repair work	Corrections and periodic inspections	Albion RP Group	EPA/MDEQ	2000/ Done	N
New gas probes and monitoring	Construction and added sampling	Albion RP Group	EPA/MDEQ	2001/ Done	N
Possible Site vandalism	Periodic inspections and corrections	Albion RP Group	EPA/MDEQ	Ongoing/ as needed	N

XI. Protectiveness Statements

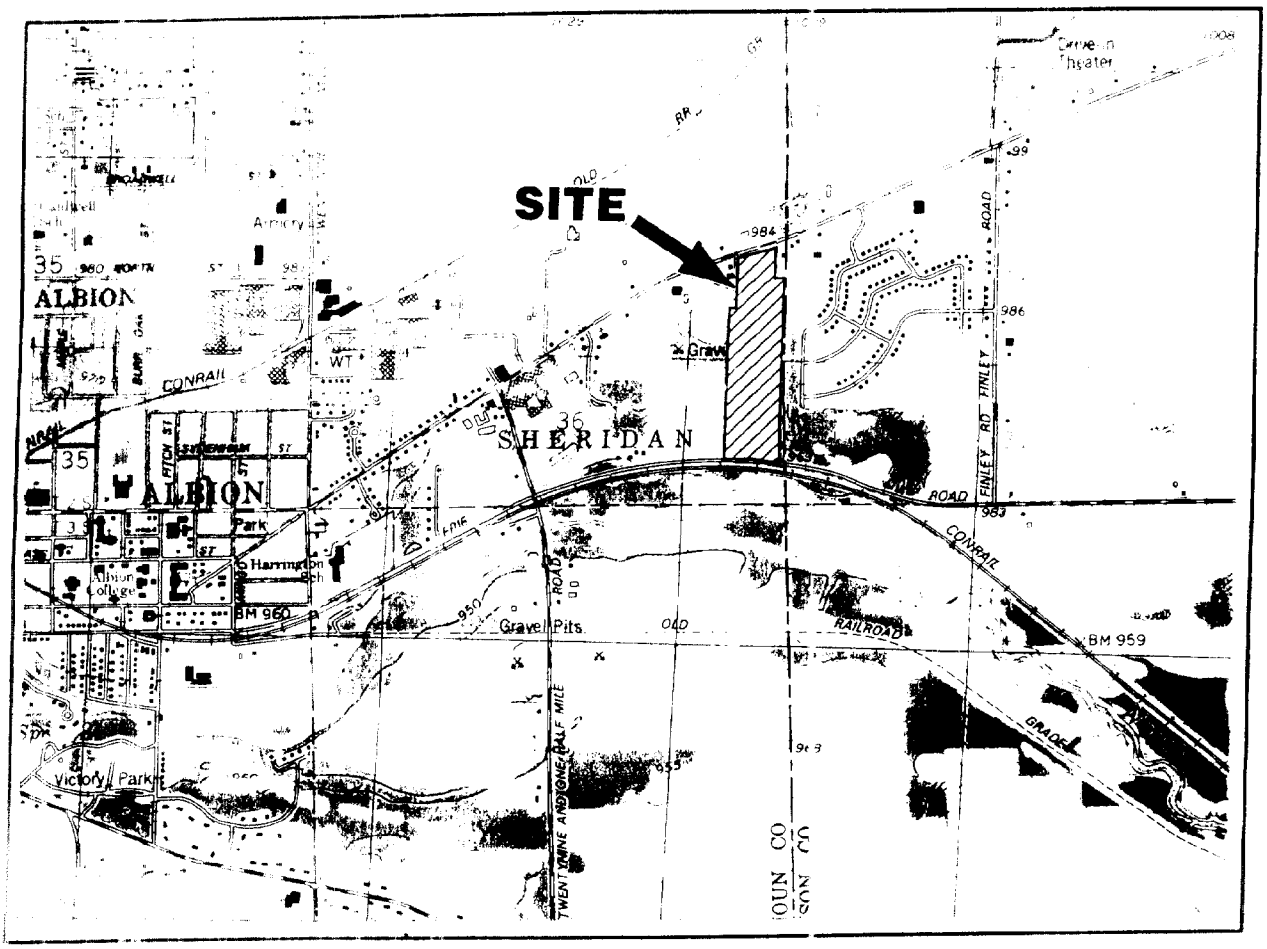
Completion of the current five-year review confirms that the Albion-Sheridan Landfill Superfund Site is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The components of the remedy selected in the 1995 Albion-Sheridan Site ROD have been implemented under the 1999 Consent Decree, and adjusted as appropriate. The Site landfill cap is functional, operational and effective, and with the 2000

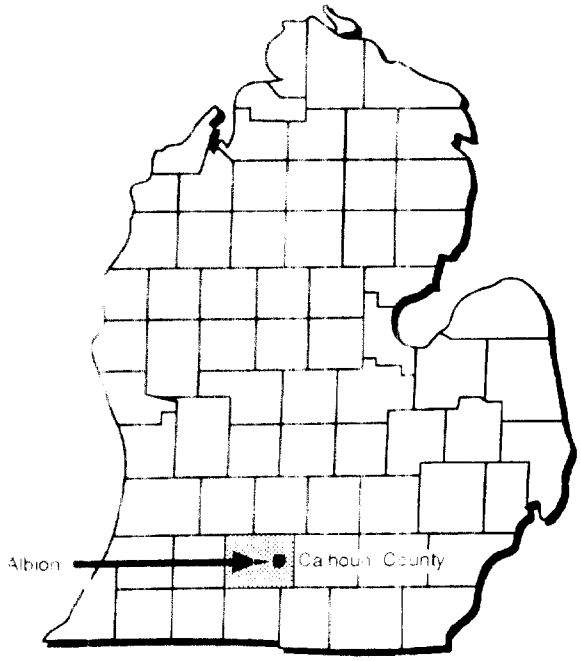
erosion repair work, assures continued protectiveness. The Site gas probe monitoring system was upgraded in 2001, and elevated gas readings along the east fence line have not occurred since July 2000. Minor erosion repairs take place with ongoing Site inspections by Albion-Sheridan responsible party group representatives and agency personnel. Restrictions for Site access and use of contaminated groundwater associated with the Site remain in place.

The Site groundwater is monitored under the 1999 Operation & Maintenance Plan. The groundwater remedy and monitoring remains protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. Recent data shows that arsenic levels are decreasing. The U.S. EPA revision of the arsenic MCL, which requires a 10 ppb level in 2006, will require future groundwater data to be analyzed under the new standard. The groundwater remedy is scheduled to be evaluated for effectiveness in 2004. Residual groundwater concentrations of manganese, ammonia and aluminum remain above Michigan residential drinking water criteria at certain Site locations. There are no primary U.S. EPA MCLs for these three compounds.

XII. Next Review

The Albion-Sheridan Landfill Superfund Site is a statutory site that requires ongoing five-year reviews. The next review will be scheduled to be completed by September 30, 2007. The completion date of the current review is the date of signature shown on the cover attached to the front of this report.





SCALE: 1 INCH = 2,000 FEET

FIGURE 1

Site Location Map

ALBION-SHERIDAN TOWNSHIP LANDFILL
Albion, Michigan

January 1992

04011

FIVE-YEAR REVIEW REPORT
LIST OF DOCUMENTS REVIEWED
SEPTEMBER, 2002

ALBION-SHERIDAN TOWNSHIP LANDFILL SUPERFUND SITE

ALBION,
MICHIGAN

1) Preliminary Close-Out Report, Albion-Sheridan Site, 9/28/99.

2) Consent Decree, Albion-Sheridan Site, July, 1999.

3) Record of Decision, Albion-Sheridan Site, March, 1995.

4) Albion-Sheridan Site file, and operation & maintenance documents.